REMARKS

In order to understand the exclusivity and novelty of our claims you must understand the difference in the actions of the three different types of springs that are used and presently patented in a large number of devices. You must also be aware of the differences in action that can be obtained from the same type of spring. Enclosed is a Glossary of spring definitions and Hooks law related to the design differences of similar springs.

The three types of springs with examples of the same spring performing different functions is as follows:

1) the **TORSION SPRING** which derives it's usefulness by trying to return to it's original shape when subject to a load traveling around its axis, in other words trying to return to its original shape when twisted. The two best examples are the hair-spring in a wind-up watch and the clothespin spring.

2) the **EXTENSION SPRING** which derives its usefulness because it pulls against a load which make it longer, in other words it returns back to its original position when stretched out and released. The two best examples are the Slinky toy spring and the screen door spring.

3) the **COMPRESSION SPRING** which derives its usefulness because it pushes against a load which makes it smaller, in other words it snaps out to its original position when squeezed and released. The two best examples are our gyrating toy and the shock absorbing springs in a car.

In each of the above three types of springs I have included as examples a soft spring and a stiff spring in accordance with Hooks Law. The easiest way to understand the difference between a soft spring and a stiff spring is to compare the Slinky toy spring and the screen door spring. If it were not for the fact that the Slinky spring is a soft spring it would just be a door spring with a slightly larger outside diameter and not patentable. Being a soft spring give Slinky an entirely different action than the stiff door spring. The same is true of the hair-spring in the watch and the close-pin spring. If the close-pin spring was a lighter weight spring it would be a hair-spring. Better yet the hair spring in an old fashioned watch and the wind up spring in the same watch are both torsion springs. The hair spring is a soft spring and the wind up spring is a stiff spring. This is also true of our soft spring gyrating toy spring compared to the automobile spring and all the other stiff spring compression spring toy patents. If the automobiles spring was much softer it would be our gyrating toy spring.

Your reference to Janas toy doll is not applicable to our claim since Janas is not a compression spring but an extension spring as described in Janas (claim 7) calling itself a contracted spring adapted to be stretched upon grasping the head and pulling thereon and striking a blow on the sound producing device when the spring has been stretched and is then released. This describes an extension spring not a compression spring. Janas is also an example of a stiff spring which cannot be easily compressed if it can be compressed at all as shown in (fig. 6). The base (2) is a circular suction cup with no weight and no indexing means. When the head is pulled up you pray the suction cup will hold to the surface to which it is attached and not release and shoot up cutting off a few fingers in the process. The weight of the head and the weight of the feet are not involved in the action of the toy. Janas does not require indexing to the base and the head because there is no front or back to the base. (16) - (16) are not finger grips. They are soft material sewn to the garment and would immediately tear off if used as finger grips to stretch the spring. As far as a doll's head (1), shoulders, arms, and hands (fig.1) this is common to any patented action doll. (12) is not a locking indentation, it is a merely a means of attachment. The smooth spring wire will rotate under the 'ears' (12)--(12) with ease. A suction cup can not be considered an open base (fig. 2). Janas toy doll is a one-shot action and reload toy

Molenaar spring toy is a Slinky extension spring as shown in (fig. 7), with a cartoon printed on it. Stretch the spring and the cartoon expands. Wilgoz lighted coil spring amusement device is again a Slinky toy extension spring (fig. 1) with lights that flash as the Slinky walks down the steps. The weight of the lights would be enough to make the Slinky action inoperable. Thomas articulated toy is not intended to bounce in place. According to the claims everything is done to slow down its motion and prevent it from bouncing and swaying including an airtight portion (23) as a noise maker, a stiff spring compression spring to slow down the motion of the arms to the mouth for more drinking realism, limiting means (36) attached to the spring to prevent the spring from extending beyond its normal standing position which would cause the beer mug to hit the drinker in the face and all the tight clothing (12) prevents the spring from taking any spontaneous action. There is also no importance or relationship to the weight of the head and the weight of the feet to the action of the toy. The toy is also designed to expand and compress only one time that is when it is pressed down and returned to it's original position by the operator. The repetitive action of the operator not the spring makes the beer mug do its thing. Thomas's articulated toy is a one shot and

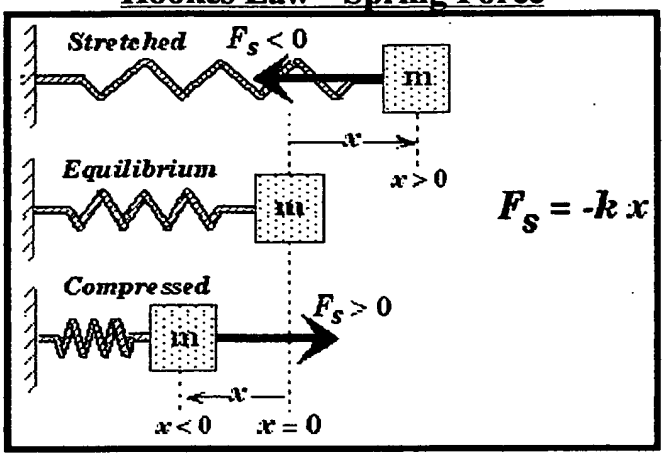
reload device. Pettersen coil spring device is a very stiff compression spring, deliberately so stiff that a child sitting on it can only rock back and forth (fig.1) and not bounce. If the spring were less stiff in order to enable the child to bounce the rocking horse would keel over under the weight of the child and cause severe injury. The devise is not mobile. Haverman toy is a completely confined stiff compression spring designed for a one-shot action. Whereas our string (17) is not necessary for the action of the toy but is used to prevent damage to the spring by over-stretching it when carried by the head, Haverman's spring (L) attached to base (B) and base (D) is necessary for the action of the toy preventing the spring from stretching too far upward and thus allowing the base (D) with the comic figure (E) on it to leave the container (A) and fall over. The same is true of Thomas's articulated toy. His string (36) is necessary for the action of the toy preventing the beer mug from hitting the figure in the face. Leach amusement device is a stiff spring, confined, limited action, one-shot compression spring similar in many respects to Thomas and Haverman. Ford leaping figure toy is again a stiff spring totally confined compression spring with a limited one-shot and reload action. Goldfarb impact reaction toy again is a stiff spring totally confined compression spring with a limited one-shot and reload action. Goldfarb game apparatus and time-delay action unit is again a stiff spring confined compression spring with a limited one-shot and reload action. Fels rocket-simulative toy is again a stiff spring confined compression spring with a limited one-shot and reload action. Chinnock jumping-toy is again a stiff spring totally confined compression spring with its action limited by tube (A) and string (H) to a one-shot and reload action.

The most obvious conclusion is that if our soft spring compression spring replaced any of the above prior art examples of stiff spring compression spring toys none of them would operate. If the soft Slinky spring would replace any of the stiff springs in other extension spring patents, such as the screen door spring, none of them would operate. Soft springs are not one-shot springs. When set in motion they will stay in motion and with a properly balanced weight they will continue to oscillate for a considerable length of time. The balancing weight on a watch hair-spring is called the 'balance wheel'. The balance weight on a Slinky is its own extra weight at the top when it is placed below the level of its base. The balanced weight of our 'gyrating toy' is the weight of its head. What the soft spring Slinky extension spring is to all the other stiff spring extension springs our soft spring compression spring is to all the other stiff

spring compression springs. There was no prior art for the soft spring Slinky and there is no prior art for our soft spring gyrating toy.

Enclosures: Glossary of spring definitions; Hooks Law.

Hookes Law - Spring Force



F_s = Force exerted by the spring. SI: N= Newton

k = Spring Constant. SI: N/m = { k Large - Stiff Spring ; k Small - Soft Spring }

x = Displacement from equilibrium position. SI: m

Hook's Law Simulation

An object is connected to a spring whose spring constant k can be change along with the object's initial position. Displayed is the spring's force on the object as well a graphical display of the object's position and velocity as function of time. Hook's Law QT Movie

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* The negative sign indicates that the spring force is a restoring force, i.e., the force F_s always acts in the opposite direction from the direction in which the system is displaced. Here we assume that the positive direction for values of x are the same as the positive values of the force.

* The origin has to be placed at the position where the spring system would be in static equilibrium for the equation $F_s = -k\,x$ to be valid. This is the location were the net force on the object to which the spring is attached is equal to zero. If not, then $F_s = -k(x - x_0)$ where x_0 is equilibrium position relative to the origin.

* Springs are normally assumed to be massless so their inertia can be neglected. This also means that the force exerted by both ends of the spring are the same but in opposite directions.

GLOSSARY

These are many of the common words that have definitions in the springmaking field. The definitions are my own (caveat) and are admittedly not complete. This is not a dictionary -- it's just another tool you can use to do a better job.

Active coil	A coil of wire which contributes to the motive force of a spring. In extension and torsion springs, all the coils are active coils. In compression springs, only the coils which show daylight between them are active coils.
Arbor	A bar or pipe around which wire is wound to form a spring.
Back gear	A mechanism in a lathe that allows the chuck to turn very slowly.
Beryllium copper (wire)	An exotic material that can be made into springs.
Bundle	A roll or coil of wire as it is shipped from the manufacturer.
Cast	The curvature in wire that results from its being bundled into coils at the factory.
Chrome Silicon (wire)	An alloy of steel, stronger than Oil Tempered wire.
Chrome Vanadium (wire)	An alloy of steel, stronger than Oil Tempered wire.
Closed and ground end	Referring to the end of a compression spring where the wire forms one dead coil and is ground square.
Closed end	Referring to the end of a compression spring where the wire forms one dead coil and is not ground square.
Coil	1) (noun) The wire of a spring going completely around once (see *active coil, dead coil*). 2) (noun) A bundle of wire as it is shipped from the factory. 3) (verb) To form (wire) into a spring.
Compression	Making smaller.

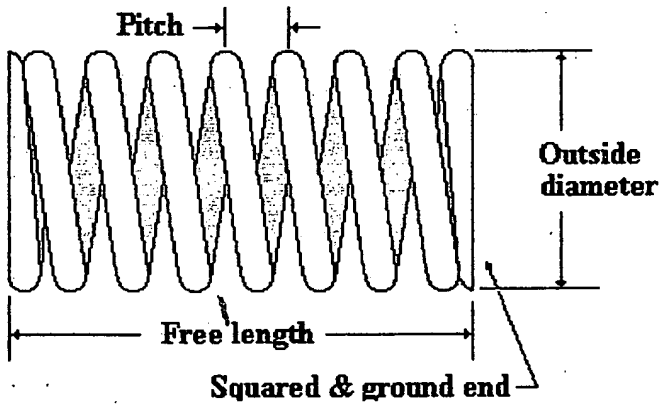
Compression spring	A spring which derives its usefulness because it pushes against a load which makes it smaller.
Dead coil	A coil of wire which does not contribute to the motive force of a spring. In extension and torsion springs, there are no dead coils. In compression springs, the coils at each end that lay against each other are dead coils: all the rest are active coils.
Double torsion	A form of torsion spring that has two coils; one left-handed and one right-handed, connected by a central tongue.
Extension	Making longer.
Extension spring	A spring which derives its usefulness because it pulls against a load which makes it longer.
Free length	The length of a spring with no load applied.
Grinding stage	A flat (usually) steel platform used to ensure that the ends of compression springs orient correctly to a grinding wheel.
Heat treat(ing)	1) The process of tempering metal. 2) (colloquially) The process of stress relief.
Lathe	A machine which derives its usefulness by rotating stock against which tooling may be brought to bear. Springs are often wound on a lathe.
Lead screw	A mechanism in a lathe that allows the tool post to move from side to side at a precise rate.
Mandrel	An arbor.
Music wire	A high-carbon steel alloy used in making springs.
Open end	Referring to the end of a compression spring where the pitch of the spring extends all the way to the end of the wire, and does not form any dead coils.
OT (Oil Tempered wire)	A lower-carbon steel alloy used in making springs.
Passivate (-ation)	The process of removing chemical coatings from stainless steel by immersion in an acid bath.
Phosphor bronze (wire)	An exotic alloy sometimes used in making springs.
Pigtail	A form taken by tie wire when used to secure a bundle of heavy spring wire.
Pitch	The distance, center to center, between two active coils of a compression spring.
Spring [dia]	A helically formed piece of (usually) wire which derives its usefulness because it tries to regain its original shape when subjected to a load. See *Compression Spring, Extension Spring, Torsion*

TOP

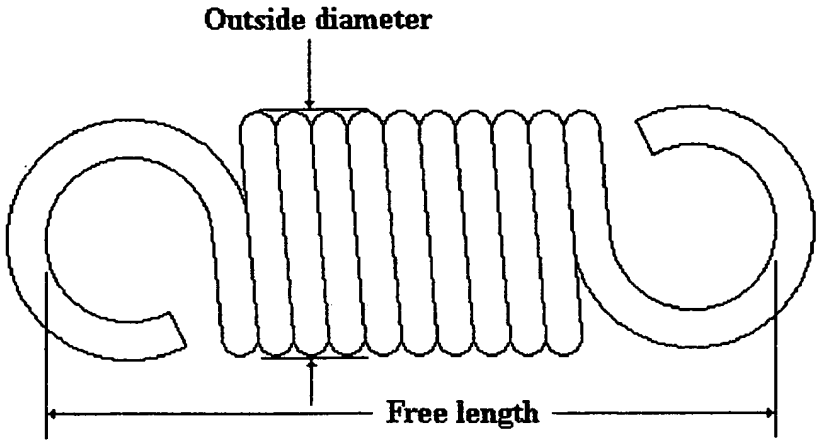
Spring.

Stainless Steel (wire)	An alloy used in making springs that will not rust. The most common stainless steels are called 302 and 17-7.
Stress	Misalignment of the molecules in wire due to bending.
Titanium	A strong, lightweight metal sometimes used in making springs.
Tool post	The part of a lathe that allows tooling to be mounted and used on stock.
Torsion	Twisting.
Torsion spring	A spring which derives its usefulness by trying to return to its original shape when subjected to a load traveling around its axis.
Variable pitch	A form of compression spring that has more than one pitch.
Wind	To coil (a spring).
Wire	Metal, usually round and solid in section, used in making springs.

Compression Spring:



Extension Spring



Torsion Spring